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Plumbers assemble, install, and repair pipes, fittings, and fixtures of water, gas, and waste disposal systems according to specifications and plumbing codes in homes and commercial and industrial buildings. Plumbers also maintain existing plumbing systems. Journey-level Plumbers may give written estimates of the cost of their work.

In new construction work, Plumbers must follow blueprints so that the plumbing lines go in the right place. They plan the job, determine the size and type of pipe to be used, and select the proper fixtures.

After the system is inspected by the building inspector, Plumbers install the necessary plumbing fixtures such as sinks, toilets, bathtubs, showers, etc. This means that Plumbers must come back to the job site after the floors and walls are up and finished.

**Tasks**

- ▶ Assemble pipe sections, tubing and fittings, using couplings, clamps, screws, bolts, cement, plastic solvent, caulking, or soldering, brazing and welding equipment.
- ▶ Fill pipes or plumbing fixtures with water or air and observe pressure gauges to detect and locate leaks.
- ▶ Review blueprints and building codes and specifications to determine work details and procedures.
- ▶ Prepare written work cost estimates and negotiate contracts.
- ▶ Study building plans and inspect structures to assess material and equipment needs, to establish the sequence of pipe installations, and to plan installation around obstructions such as electrical wiring.
- ▶ Keep records of assignments and produce detailed work reports.
- ▶ Perform complex calculations and planning for special or very large jobs.
- ▶ Locate and mark the position of pipe installations, connections, passage holes, and fixtures in structures, using measuring instruments such as rulers and levels.
- ▶ Measure, cut, thread, and bend pipe to required angle, using hand and power tools or machines such as pipe cutters, pipe-threading machines, and pipe-bending machines.

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- ▶ Install pipe assemblies, fittings, valves, appliances such as dishwashers and water heaters, and fixtures such as sinks and toilets, using hand and power tools.

Detailed descriptions of this occupation may be found in the Occupational Information Network (O\*NET) at [online.onetcenter.org](http://online.onetcenter.org).

### Important Skills, Knowledge, and Abilities

- ▶ Building and Construction — Knowledge of materials, methods, and the tools involved in the construction or repair of houses, buildings, or other structures such as highways and roads.
- ▶ Mechanical — Knowledge of machines and tools, including their designs, uses, repair, and maintenance.
- ▶ Mathematics — Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.
- ▶ Customer and Personal Service — Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.
- ▶ Troubleshooting — Determining causes of operating errors and deciding what to do about it.
- ▶ Active Listening — Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
- ▶ Arm-Hand Steadiness — The ability to keep your hand and arm steady while moving your arm or while holding your arm and hand in one position.

### Work Environment

Because pipelayers, plumbers, pipefitters, and steamfitters frequently must lift heavy pipes, stand for long periods, and sometimes work in uncomfortable or cramped positions, they need physical strength as well as stamina. They also may have to work outdoors in inclement weather. In addition, they are subject to possible falls from ladders, cuts from sharp tools, and burns from hot pipes or soldering equipment.

Many Plumbers belong to the United Association of Journeymen and Apprentices of the Plumbers and Pipefitting Industry of the United States and Canada. The work week for union Plumbers varies with the union local. Most Plumbers work 35 to 40 hours per week.

### California's Job Outlook and Wages

The California Outlook and Wage table below represents the occupation across all industries.

Standard Occupational Classification	Estimated Number of Workers 2004	Estimated Number of Workers 2014	Average Annual Openings	2006 Wage Range (per hour)
<b>Plumbers, Pipefitters, and Steamfitters</b>				
47-2152	54,800	67,500	2,530	\$15.50 to \$27.74

*Wages do not reflect self-employment.*

*Average annual openings include new jobs plus net replacements.*

*Source: [www.labormarketinfo.edd.ca.gov](http://www.labormarketinfo.edd.ca.gov), Employment Projections by Occupation and OES Employment & Wages by Occupation, Labor Market Information Division, Employment Development Department.*

## Plumbers, Pipefitters, and Steamfitters

### Trends

This occupation will have a healthy growth rate of more than 23 percent during the 2004–2014 projection period. This growth will be fueled in large measure by the increased demand for new housing in California as well as the need for plumbers in building renovation and water system repair.

### Training/Requirements/Apprenticeships

Plumbers usually follow one of the following training paths:

- ▶ Formal apprenticeship
- ▶ Extensive on-the-job training
- ▶ Vocational school

Some Plumbers train on the job, but most complete an apprenticeship program. The length of an apprenticeship is usually four to five years. The programs consist of full-time on-the-job training in addition to classroom instruction. The courses include drafting, blueprint reading, math, and local plumbing codes and regulations. After completing the program, apprentices must pass a trade test given by the union and a city licensing test regulated by the California Department of Industrial Relations, Division of Apprenticeship Standards. Candidates for apprenticeships must have a high school diploma or its equivalent and must pass aptitude tests. More information on apprenticeship programs can be obtained from local unions and the California Department of Industrial Relations, Division of Apprenticeship Standards ([www.dir.ca.gov/das](http://www.dir.ca.gov/das)).

Plumbers must be licensed, but licensing requirements vary from area to area. Most localities require Plumbers to pass an exam testing their knowledge of the trade and local plumbing codes.

### Recommended High School Course Work

Drafting and mathematics classes are recommended as preparation for a career as a Plumber.

### Where Do I Find the Job?

Candidates for training or apprenticeship programs should apply to the one of the several unions for Plumbers. Direct application to employers is an effective job search method for journey-level Plumbers.

Use the *Search for Employers by Industry* feature on the *Career Center* page at [www.labormarketinfo.edd.ca.gov](http://www.labormarketinfo.edd.ca.gov) to locate employers in your area. Search using keywords from the following construction industry names to get a list of private firms and their addresses:

- |                             |                              |
|-----------------------------|------------------------------|
| ▶ New Multifamily Housing   | ▶ Power/Communication System |
| ▶ New Single-Family Housing | ▶ Residential Remodelers     |
| ▶ Oil and Gas Pipeline      | ▶ Water and Sewer System     |

For local listings of contractors, search these **yellow page** headings for listings of private firms:

- |  |                                       |
|--|---------------------------------------|
| ▶ Plumbing Contractors                   | ▶ Plumbing Drains & Sewer Cleaning    |
| ▶ Plumbing Contractors-Commercial & Ind. | ▶ Plumbing Drains & Sewer Consultants |

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## Where Can The Job Lead?

Journey-level Plumbers can advance to the positions of supervisor or superintendent. Plumbers with considerable experience may become plumbing inspectors.

Plumbers may go into business as plumbing contractors. Businesses involved in electrical contracting need licensing from California's Department of Consumer Affairs, Contractors State Licensing Board.

## Other Sources of Information

Plumbing-Heating-Cooling Contractors National Association  
[www.phccweb.org](http://www.phccweb.org)

United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry  
[www.ua.org](http://www.ua.org)

California Department of Industrial Relations, Division of Apprenticeship Standards  
[www.dir.ca.gov](http://www.dir.ca.gov)

California Department of Consumer Affairs, Contractors State Licensing Board  
[www.cslb.ca.gov](http://www.cslb.ca.gov)